

November 24, 1999

IN THE CLAIMS:

Please amend the claims to read as follows:

WYS E2 > 1. (Third Time Amended) A thermoforming apparatus comprising:
a thermoforming machine fitted with at least one female die and counter-die reciprocally approachable and removable for the operations of closing, thermoforming and opening;
a feeder for feeding thermoforming material between each female die and counter-die;
extraction pick-up means adapted to withdraw a thermoformed article from the female die and to transfer it to a receiving [coveying] conveying template, at least one of said extraction pick-up means and said conveying template including a receiving hole for each thermoformed article to be extracted, each receiving hole being defined along its depth by two annular surfaces reamed in opposite directions and defining between them an equatorial shoulder for engaging and positioning each thermoformed article.

WYS E3 5. (Three Times Amended) A thermoforming apparatus as claimed in Claim 1, further comprising:

Q3 a chain conveyor wound by a pair of chain wheels and having a run thereof extending along the respective die or counter-die but beyond the encumbrance thereof; and

wherein said extraction pick-up mean comprises plurality of extraction plates carried at predetermined intervals from each other on said conveyor, each extraction plate being fitted with said receiving holes with equatorial shoulders for

retaining the thermoformed articles in proper orientation during their conveyance.

Sub E5
8. (Four Times Amended) A thermoforming apparatus as claimed in Claim 1, further comprising a template conveyor extending through at least one work and/or treatment station and moving stepwise at the opening-closure rate of the dies for receiving [a] thermoformed articles from an extraction plate associated with said extraction pick-up means, said extraction plate withdrawing a thermoformed article from the female die and to transferring it to said conveying template, [and] said template conveyor conveying [them] the thermoformed articles in sequence to said at least one work and/or treatment station along the template conveyor.

Sub E7
7. (Three Times Amended) A thermoforming apparatus as claimed in Claim 6, wherein said template conveyor comprises two alternately movable conveying templates, so that one of said conveying templates is moved laterally, in relation to the female die, at said at least one work and/or treatment station, while the other conveying template is in front of it to receive a thermoformed article from the extraction plate.

Sub G4
8. (Three Times Amended) A thermoforming apparatus as claimed in Claim 6, wherein said template conveyor is a chain conveyor which comprises a pair of chain wheels around which a respective chain is wound, a plurality of said conveying templates carried, spaced at a predetermined distance from each other, on said chain conveyor and each fitted with said equatorial shoulders retaining the thermoformed articles in proper orientation during their conveyance.

November 24, 1999

10/5
Sub 15

9. (Three Times Amended) A thermoforming apparatus as claimed in Claim 6, [wherrein] wherein said template conveyor comprises a train of articulated bearing slides or carriages for a respective conveying template moving through said at least one work and/or treatment station.

Sub 17
06

11. (Three Times Amended) A thermoforming apparatus as claimed in Claim 10, wherein said collar is constituted of resiliently deformable material suitable for [exerciting] exercising retentive pressure on the external surface of a thermoformed article.

Sub 16

12. (Three Times Amended) A thermoforming apparatus as claimed in Claim 10, wherein said collar comprises a plurality of resiliently loaded ratchets, installed in said collar and movable towards its internal diameter for engaging with the external surface of a thermoformed article in a respective receiving seat in said receiving hole.

Sub E5
01

14. (Three Times Amended) A thermoforming apparatus as claimed in Claim 10, wherein the thermoformed articles have rims and wherein [each] said conveying template [(17) at each flanged receiving set for thermoformed rimmed articles (15)] has a peripheral recess formed on the surface of the template about [a] the receiving hole for engaging the rim of a theremoformed article received in the receiving hole.

Sub G5

15. (Four Times Amended) A thermoforming apparatus as claimed in Claim 6, wherein the thermoformed articles have rims and [further including] wherein said

SUB G5

conveying template includes a two-diameter adaptor collar installable in a receiving seat of an opening in said conveying template, [and] said adaptor collar providing said receiving hole in said conveying template and having an internal diameter delimited by a tapered [under] upper section, [and] an undercut intermediate section, an annular shoulder downstream of the undercut section, for receiving a thermoformed article and snap-engage its rim at said undercut section.

OJ

16. (Three Times Amended) A thermoforming apparatus as claimed in Claim 6, wherein the thermoformed articles have rims and wherein said receiving holes have a slightly smaller internal dimension than the external dimension of the thermoformed articles adjacent their rims [(15)] to be received, so that the thermoformed article is resiliently constrained [and] and properly oriented in the respective receiving hole.

SUB T12

17. (Three Times Amended) A thermoforming apparatus as claimed in Claim 6, further including eccentric mechanical arrests, each of which is fitted at a respective receiving hole of a conveying template and is movable between an operating position in which it engages the rim of a flanged thermoformed article and an inoperative releasing position.

OG

20. (Four Times Amended) A thermoforming apparatus as claimed in Claim 6, further including a cup-shaped receiving component for a thermoformed article, the cup-shaped [compoenent] component being disposed adjacent at least one of said receiving holes and having at least one orifice in a bottom of the cup-shaped component.

SUB M

Subj 4

21. (Three Times Amended) A thermoforming apparatus as claimed in Claim 20, further comprising a push rod for expelling the thermoformed article from the cup-shaped component by acting through said at least one orifice in the bottom of the cup-shaped component.

AOB Sub E6

22. (Four Times Amended) A thermoforming apparatus as claimed in Claim 1, wherein the thermoformed articles have rims and wherein said receiving hole has a support shoulder for shallow, thermoformed articles arranged between each receiving hole, said equatorial shoulder including an annular projection which engages the internal diameter of the rim of the article.

Subj 5

23. (Four Times Amended) A thermoforming apparatus as claimed in Claim 6, wherein said template conveyor includes a plurality of conveying templates and wherein said retention means comprises a push-rod which rises from a surface of each conveying template.

Sub E7 OJ

25. (Amended) A thermoforming apparatus comprising at least one female die and counter-die reciprocally approachable and moveable for the operations of closing, thermoforming and opening, a feeder apparatus adapted for feeding thermoforming material between each female die and counter-die, and an extraction pick-up apparatus adapted to withdraw at least one thermoformed article from the female die and to transfer said at least one thermoformed article to a receiving conveying template, at least one of the extraction pick-up apparatus and the receiving conveying template including a retention surface adapted to

November 24, 1999

Sub E1

~~engage each thermoformed article, at least one retention surface being defined by at least a portion of a wall of a cavity in an element associated with at least one of the extraction pick-up apparatus and the receiving conveying [apparatus] template, the cavity communicating with at least one exterior surface of the element and having an interior dimension which is smallest in a region remote from said exterior surface to define a shoulder thereat for resiliently holding a thermoformed article disposed in the cavity.~~

Sub F1

26. (Amended) The thermoforming apparatus of claim 25 wherein the element is a plate and has two exterior surfaces [are] disposed essentially parallel to each other, the cavity communicating with both exterior surfaces.

Sub E8

28. (Amended) The thermoforming apparatus of claim [26] 27 wherein the two annular surfaces intersect each at a plane which is disposed perpendicular to an axis of the cavity.

Sub H1

34. (Amended) The thermoforming apparatus of claim 33 wherein the two annular inclined surfaces intersect each at a plane which is disposed perpendicular to an axis of the cavity.

Sub J2

36. (Amended) The thermoforming apparatus of claim 31 wherein the thermoformed article has a rim and wherein the retention surface is defined by the shoulder on the wall of said cavity, the shoulder having a slightly undercut, internal angle of incidence, in order to allow insertion by the thrust of a rimmed thermoformed article and to enable the rimmed thermoformed article to be

1/2
November 24, 1999

1/2
resiliently constrained and held firmly in position at its rim.

1/3
38. (Amended) The thermoforming apparatus of claim 37 wherein the wall of [the hole] the hole in the plate is defined by two annular inclined surfaces which intersect each other at the shoulder.

1/3
39. (Amended) The thermoforming apparatus of claim 38 wherein the two annular inclined surfaces intersect each at a plane which is disposed perpendicular to an axis of the hole in the plate.

1/4
42. (Amended) A thermoforming apparatus as claimed in Claim 1, wherein said [pick-up] extraction pick-up means comprises a plate-like head arranged to be sequentially inserted between the or each female die and counter-die concomitantly with each opening of the same.

Remarks

As the Examiner will note by reference to the amendment made to the specification, this application has been made a continuation-in-part of USSN 08/481,458 which is a national stage application based on PCT/EP93/03700 filed December 27, 1993. For the Examiner's information, USSN 08/481,458 apparently served as the basis for the filing of another continuation-in-part application (USSN 09/914,134 filed August 19, 1997 which has been allowed). The undersigned is not responsible for the prosecution of those applications and therefore must rely on data received from others for this information. However, since this application has